

WHAT IS CLAIMED IS:

1. A coiled tubing conveyed drilling assembly for use in drilling of a wellbore, comprising:

(a) a drilling motor for generating a rotary force in response to the flow of a drilling fluid through the drilling motor; and

(b) a steering device integrated into the drilling motor for altering the drilling direction of the wellbore, said steering device including:

(i) a plurality of force application members arranged around a section of the drilling motor, each said force application member extending radially outward from the drilling motor to apply force to the wellbore inside, upon the application of power thereto;

(ii) a power unit for supplying power to the force application members; and

(iii) a separate control device for controlling the supply of the power to the force application members.

2. - The drilling assembly according to claim 1, wherein the power unit includes a pump for supplying pressurized fluid to the force application members.

3. The drilling assembly according to claim 1, wherein the power unit includes a separate electric motor associated with each control device, each

1 said electric motor controlling a linear motion of its control device to move the
2 force application member between a normal position and an extended position.

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4 4. The drilling assembly according to claim 1 further comprising a control
5 circuit for controlling the operation of the control devices.

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7 5. The drilling assembly according to claim 4, wherein the control circuit is
8 placed in a rotating part of the drilling motor.

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10 6. The drilling assembly according to claim 1, wherein the drilling motor
11 includes a power section and a bearing assembly and wherein the steering
12 device is integrated in the bearing assembly.

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14 7. The drilling assembly according to claim 1, wherein each control device
15 is a fluid control valve.

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17 8. The drilling assembly according to claim 1, wherein the power unit
18 includes a pump for supplying a pressurized fluid to each of the force
19 application members to move each said force application member between a
20 normal position and a radially-extended position.

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22 9. The drilling assembly according to claim 1, wherein the power unit
23 includes a separate pump associated with each said force application member
24 for moving each force application member between a normal position and a

radially-extended position.

10. The drilling assembly according to claim 7 further comprising a valve actuator for each said control valve for controlling the operation of such control valve.

11. The drilling assembly according to claim 10, wherein the valve actuator is selected from a group consisting of (a) a solenoid; (b) a magnetostrictive device; (c) an electric motor; and (d) a piezoelectric device.

12. The drilling assembly according to claim 11, wherein the valve actuator is duty cycled to control the supply of a pressurized fluid to its associated force application member.

13. The drilling assembly according to claim 1, wherein the power unit is operated by one of (a) a rotating shaft associated with the drilling motor, and (b) an electric motor.

14.- The drilling assembly according to claim 1, wherein the drilling fluid is selected from a group of fluids consisting of a (i) liquid, (ii) gas, and (iii) liquid-gas mixture.

15. The drilling assembly according to claim 1, wherein each force application member includes a piston that radially moves a rib member of the force

1 application member upon receiving the pressurized fluid from the power unit.

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3 16. The drilling assembly according to claim 1 further having a sensor
4 associated with each force application member for providing signals indicative
5 of the position of each such force application member relative to a reference
6 position.

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8 17. The drilling assembly according to claim 16 wherein the control circuit
9 independently controls the operation of each force application member in
10 response to the measurements of the sensors and according to instructions
11 provided thereto.

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13 18. A coiled tubing conveyed drilling assembly for use in drilling a wellbore,
14 said drilling assembly comprising:

15 (a) a drilling motor having an outer housing, said drilling motor
16 generating a rotary force in response to the flow of a pressurized
17 fluid through the drilling motor; and

18 (b) a first plurality of hydraulically-operated force application members
19 arranged around an outer surface of the housing, each said force
20 application member extending radially outward from the housing
21 upon the supply of a pressurized fluid thereto to apply force to the
22 wellbore inside;

23 (c) a power unit disposed uphole of the drilling motor for supplying
24 hydraulic power to the force application members; and

(d) a separate conduit in the housing associated with each of the force application members for supplying the pressurized fluid from the power unit to its associated force application member.

19. The drilling assembly according to claim 18, further comprising a separate fluid control device associated with each force application member for controlling the supply of the pressurized fluid from the power unit to its associated force application member.

20 The drilling assembly according to claim 18 further comprising a second plurality of force application members on the drilling assembly and spaced apart from the first plurality of force application members.

21. The drilling assembly according to claim 20, wherein the second plurality of force application members receive pressurized fluid from the power unit in the drilling assembly and are controlled by the control circuit.